

Staffordshire Adaptation Strategy



STAFFORDSHIRE
SUSTAINABILITY BOARD



NEWCASTLE-UNDER-LYME
BOROUGH COUNCIL



South Staffordshire Council



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Foreword



Councillor Simon Tagg
Chair, Staffordshire Sustainability Board

One of the most critical challenges facing the world today is the changing climate. Locally, we can see the impacts of climate change, for example, the record-breaking heat of 2022 and the increasing number of damaging storms and floods over the past few years.

The evidence shows that as the climate continues to change, Staffordshire can expect summers to be drier, winters wetter, and more extreme weather events to become more frequent.

While it's important that councils have made commitments to reduce carbon emissions, this alone is not sufficient. Even if we could immediately reduce our emissions to zero, the climate would still change. Therefore, we must also focus on building resilience into our services and local environment, and helping communities and businesses cope with the effects of the changing climate.

I am delighted to present this Adaptation Strategy which demonstrates a commitment of Staffordshire Councils to work together to build a positive future. By identifying the risks, opportunities, and actions, we can better prepare ourselves to respond and adapt to the changing climate in the future. It's important to act now, and I'm confident that by working together through the Staffordshire Sustainability Board, we can become more resilient to the impacts of climate change.

Councillor Nigel Yates
Vice chair Staffordshire Sustainability Board

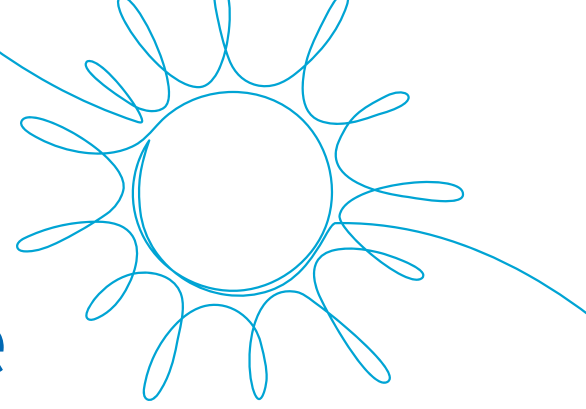
Working together the Staffordshire Sustainability Board, will allow the councils of Staffordshire to ensure that the main effects of climate change are considered in adapting to scenarios presented to us through a changing climate.

This strategy document will enable the councils at all levels in Staffordshire to go forward in a positive and structured manner so that the services we offer and the communities and businesses that we serve are supported by resilient council plans.





Staffordshire's Changing Climate



Climate change is causing a shift in our long term weather conditions and affects the whole world. One of the main reasons for this problem is that we have been using a lot of coal, oil, and gas, going back to the pre-industrial period. Burning these fossil fuels releases gases that trap heat in the atmosphere causing the earth's temperature to increase.

Over the last 150 years the average temperature across the world has warmed by 1.2°C. That might not sound like a lot, but the rate at which the Earth's temperature has been increasing has been getting faster. Since the 1980's, the rate

has almost doubled compared to 1900-1980¹. This is changing our climate putting our livelihoods and our wildlife at risk.

¹ National Centers for Environmental Information Annual Report 2021.

Historic UK Severe Weather Events

2000  Record April rainfall Record autumn rainfall	2012  Wettest for 50 years	2020  Storm Dennis record rain and strong damaging wind
2002  Record Autumn rainfall	2015 Mildest December	2021 Record rainfall over 3 days (January)
2003 Mildest January day  Record summer temperature	2018 Mildest April day for 70 years	Record mild March temperature
2007 Record summer rainfall	2019 Record mild February temperature  Record summer temperature Record mild December temperature	Record mild December temperature
		2022  UK exceeds 40 degrees for the first time



The climate is changing in Staffordshire. For example, in 2022 the temperature in Staffordshire went over 40 degrees centigrade, which is a new record. There have also been at least 15 significant floods in Staffordshire since 2000, with 9 of these storm events happening between 2018 and 2022.

In February 2020, during Storm Dennis, 281 properties in Staffordshire were flooded. The UK Climate Projections say that our climate will continue to get warmer in the next few decades, even if we reduce the amount of carbon emissions we produce. However, it's hard to predict what will happen later in the century because it depends on how much carbon emissions are reduced worldwide. Along with changes to the average temperature and rainfall, we will also have more extreme weather in Staffordshire. This means we'll have:



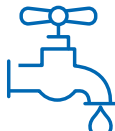
Increased chance of rivers and streams flooding



More extreme heatwaves



Flash floods at all times of the year



Drier summers and water shortages

We can help make things better by taking action now to protect our local environment and livelihoods alongside our plans to reduce carbon emissions. This will help make Staffordshire more resilient to handle future changes in the climate.

In 2022, the UK government revised the risks that climate change could cause in the UK.

They identified 61 different risks and opportunities and put them into 8 categories, including:

- › The impact on habitats and species.
- › The impact on health of the soil.
- › Risk to natural carbon stores and removal of carbon from the atmosphere, known as carbon sequestration.
- › The impact on local crops, livestock, and commercial trees.
- › The impact on getting food, goods and vital services.
- › How people and the economy will be affected.
- › The impact on people's health, wellbeing, and productivity.
- › The impact from other countries.

The West Midlands Climate Change Risk Assessment and Adaptation Plan 2021-2026 (Sustainability West Midlands) looked at these risks and opportunities that climate change could cause in the West Midlands region.

They have identified some high-level actions that can be taken to help adapt to these changes.

The information from this plan has been used to understand the risks and opportunities specific to Staffordshire.

For the West Midlands the latest projections are:

West Midlands	2050	2080
Mean annual temperature	↑ 1.2°C	↑ 1.3°C - 2.4°C
Mean winter temperature	↑ 1.1°C	↑ 1.2°C - 2.0°C
Mean winter precipitation	↑ 6%	↑ 9% - 14%
Mean summer temperature	↑ 1.7°C	↑ 1.9°C - 3.2°C
Mean summer precipitation	↓ 15%	↓ 19% - 26%

Source: UK Climate Projections (UKCP) taken from UKCP18 projections



Our Vision

A resilient Staffordshire will be an attractive, safe and healthy place to live and work offering an excellent quality of life, thriving environment and prosperous economy.



Our Ambition

We will

Recognise that adapting to climate change is a vital part of planning for the future and will consider adaptation planning across all council services.

Understand the risks and vulnerability climate change poses to Staffordshire, the places we live and work and how these can be made more resilient to climate change.

Adopt a flexible pro-active approach to adaptation to account for the dynamic and uncertain future climate change scenarios and significance of the impacts.

Taking a Joined-up Approach

Climate change has the potential to impact all council services and we need to plan for the future. This means looking at all the things we do and thinking about how to make them more resilient to climate change to protect people's lives and livelihoods.

We will collaborate as councils with the public and private sector, communities and businesses to maximise the outcomes we can achieve across the county. Through a managed approach and working together our ability to adapt and influence will be increased.

It is essential that we act now and put measures in place to allow for a good quality of life and protect Staffordshire's environment and economy now and for the future. These measures will be taken alongside our efforts to achieve net zero carbon emissions.

This Strategy includes a range of objectives across the key themes for Staffordshire Councils to reduce exposure to climate change risks and capitalise on new opportunities. The themes are:



**Critical
Infrastructure
and Buildings**



**Natural
Environment and
Green Spaces**



**Health,
Wellbeing
and Safety**



**The
Local
Economy**

How Climate Change Can Impact Our Service Delivery



Critical Infrastructure and Buildings

Extreme weather events like flooding and storms can damage a buildings integrity and infrastructure, which can affect the usability of the space and business operations.

The damage caused by extreme weather events can disrupt business and the councils' ability to provide reliable services for the local community. It is important to make sure our built environment is resilient to these climate-related hazards. This means thinking about where and how we build new structures, and how we maintain existing ones.

Green infrastructure, like parks and street trees, and blue infrastructure, like rivers, wetlands and Sustainable Drainage Systems (SuDS) can help protect and enhance our built environment against our changing climate. Incorporating these features into good building design will make our infrastructure and buildings more robust and better able to withstand climate-related hazards.

Transport and travel

Extreme weather events such as heatwaves, floods and storms can cause problems for our transportation infrastructure and access along these networks. Heatwaves increase the risk of natural fires starting on grass verges and have caused the tarmac on some roads to soften. Storms have led to landslides blocking routes and flooding roads especially in low lying areas and floodplains.

These events can cause road closures and damage to roads. How we manage the risks and hazards to services in a changing climate, especially during extreme weather events will form a key part of business continuity planning.

Buildings

Flood events can cause a lot of damage to properties causing disruption and costly repairs. Summer heat, especially that experienced in 2022 can make living and working spaces uncomfortable and can be a danger to health, especially the vulnerable.

Nature based solutions, such as green spaces and SuDs have an important role to play in creating climate change resilience providing natural cooling and helping to minimise flood risk to buildings.

CASE STUDY 1

Developing Houses Fit for the Future EXETER CITY COUNCIL

Exeter City Council has been using a planned approach to low energy housing developments, which has led to the creation of 103 certified Passivhaus homes.

These homes have been built to be low energy, climate ready and improve health through building biology. They have been tested against future climate conditions to ensure resilience to 2080, and alongside this residents have already experienced health improvements and better indoor air quality

Source: SWM (2022) Climate change adaptation: practical examples for local authorities.

CASE STUDY 2

Residential Flood Alleviation Scheme

HAMSTALL RIDWARE



Staffordshire County Council installed new oversized drainage assets to better protect 18 residential properties in Hamstall Ridware.

This Surface Water Flood Alleviation scheme combined with natural flood management works undertaken by South Staffs water.

The creation of a bund within the field near the village helps to hold back flood water and installation of leaky dams has slowed the flow of water in the ditch.

Modelling showed that in a 100-year flood event (having a 1% chance occurring in any year), the scheme would prevent 9,000 cubic metres of surface water entering the village reducing this water volume to just 33 cubic metres and in doing so significantly reducing flood risk.

Source: SWM (2022) Climate change adaptation: practical examples for local authorities.



CASE STUDY 3

Stafford Brooks Project STAFFORD



Stafford Brooks project will restore the floodplains to help increase their ability to store water when river and waterway levels rise.

It targets 25 locations along Stafford's rivers and streams, improving habitats which will enable wildlife to thrive.

This project will reduce flood risk to nearby houses and businesses, alleviating seasonal pressures felt across the town caused by regular flooding. This project also has a particular focus on extending, restoring and creating new habitats. These restored areas will become home to a variety of wildlife including otters, wading birds and a range of amphibians.

The new developments will also use natural solutions such as wetlands and reed beds to help filter polluted run-off from roads.

Source: SWM (2022) Climate change adaptation : practical examples for local authorities.





Natural Environment and Green Spaces

The changing climate is putting our natural environment under pressure with some species struggling to adapt quickly enough to the changes.

Warmer temperatures increases the vulnerability of species to pests and diseases and increases the risk of invasion from exotic species. Hotter drier conditions increases the risk of wildfires which can cause serious damage to habitats and communities.

The timing of our seasons is changing and affecting the availability of food for many species at crucial times of the year, especially breeding and migratory species.

Habitats and species

The changing climate and extreme weather can damage vegetation, plants and our soils, causing challenges to our wildlife. To help them adapt, we need to increase our understanding of species habitat requirements to create more resilient environments.

Improving the quality, diversity and size of habitats and connectivity will help species move through the landscape as the climate changes. We will work together to share ideas and methods, and make sure that our habitats are diverse to provide the best survival chances.

The changing seasonality will impact our management of habitats due to earlier breeding seasons. This is reducing the time period when some works can be completed putting pressure on resources and will require us to adjust our management regimes.



Enjoying our open spaces

Our open spaces are not only valuable for biodiversity, they can also reduce air pollution and provide recreational space for people to enjoy.

Extreme weather conditions can erode footpaths, wash out bridges and create landslips making access to our open spaces and footpaths hazardous or impassable, increasing pressure on resources.

New ways of managing access to these open spaces needs consideration, moving away from costly hard engineering solutions to identifying how best to adapt to the changing conditions. This requires a more holistic approach to management, working with stakeholders and landowners to consider implementation of offsite positive solutions.

Natural flood risk management

Flood events are occurring more frequently, and it is predicted the intensity and duration of flood events will increase in the coming decades.

We need to better understand our flood risk so that we can plan, respond and recover from flood events to maximise the best possible outcomes for the people of Staffordshire.

There are many sources of flooding and various organisations have a duty to oversee or manage these sources to better manage risk. Improved sustainable outcomes are possible if we all work together.

Through working closely with organisations and landowners we can promote more effective management.

Engaging with our communities will be an essential part of this process to raise awareness and ensure they are well informed and resilient to future flood risk.

CASE STUDY 4

The Washlands Enhancement Project BURTON ON TRENT



The Washlands is a functional flood plain along the River Trent through to the centre of Burton.

In 2018 East Staffordshire Borough Council, in partnership with the Environment Agency and other public and private sector partners, launched a new shared landscape vision for the Washlands.

Between June 2019 and June 2022 the Environment Agency upgraded 9km of flood defences along the river at a cost of £2.8 million to account for climate change.

To accompany the upgrade of the flood defences East Staffordshire Borough Council established the Washlands Enhancement Project.

The aim of the project is to balance regular flooding with public access and recreation alongside nature conservation and a more environmentally sensitive approach to green space management.

The project will contribute to the regeneration of the town by turning an underutilised open space into a regional tourism destination and is due for completion in 2023.

CASE STUDY 5

Creating a Cooler Greener Place to Live KENT

Urban residential areas in particular are experiencing increasing heat stress from rising summer temperatures.

Two residential streets in Margate, Kent were selected to benefit from a tree planting programme that was specially designed to reduce heat stress during high temperatures, and surface water flooding following heavy rainfall.

Specialist SuDS 'tree pits' were retrofitted in the highway verges of the two identified streets.

This solution increases canopy cover to provide cooling during the summer months,

whilst also reducing surface water flood risk in the residential areas. These pits reduce surface water flooding by slowly infiltrating the water into the ground, reducing the volume of water flowing into the local sewage network.

The trees were selected based on their canopy size, their ability to withstand drought and heavy rainfall, and their capacity to support biodiversity.

Instead of the drainage systems only being able to cope with one in five-year rainfall events, the new drainage system can now withstand one in 30-year events, and has reduced flood risk to 30 properties.

The trees provide natural cooling by reducing the air temperature in residential areas, as the leaves reflect sunlight and provide shade during the summer.

This project has brought benefits to both residents and visitors and has demonstrated how multifunctional climate change adaptation projects can provide cross-cutting benefits to communities previously at risk.

Source: SWM (2022) Climate change adaptation : practical examples for local authorities.

Health, Wellbeing and Safety

Hotter summer days can harm people's health by causing heat stress and respiratory problems from reduced air quality.

Vulnerable and elderly people, especially those in deprived areas, are most at risk. Urban areas are particularly vulnerable due to the urban heat island effect. In 2022, extreme heat days in England and Wales led to a 10.4% increase in death rates compared to non-heat periods.

The role of good building design and blue and green infrastructure for our new and existing properties and neighbourhoods are important for providing natural cooling and access to cool spaces during extreme heat days. To help improve local air quality and provide a more comfortable space to live, work and for recreation we need to consider ways to better integrate blue and green infrastructure and better building design across Staffordshire. Conversely, extreme cold weather can lead to excess winter deaths caused by poor-quality, poorly-insulated, and inadequately heated housing.

We estimate a reduction in fuel poverty could reduce health and social care expenditure by £207.3m per year.

The Staffordshire Warmer homes Partnership was launched in May 2019. While predominantly a flagship public health programme, the scheme also supports priorities beyond health including sustainability by improving energy efficiency of housing stock. We will continue to seek funding opportunities to improve energy efficiency of residential housing stock.

People who work solely or predominantly in the outdoors are more exposed to the extreme weather conditions. These people need to be protected as much as possible to minimise any risk to health while at work. New ways of working may need to be considered to ensure appropriate protection methods are in place for all staff.

Additionally planning and responding to extreme weather events can place significant pressure on staff resources. Planning for these events by having appropriate plans, risk assessment and climate related response cover in place may need greater consideration.

CASE STUDY 6

Keep Bristol Cool Mapping Tool BRISTOL



Different people can be vulnerable to heat in different ways, depending on their sensitivity to heat, their ability to adapt to high temperatures, and their exposure to high temperatures both inside and outdoors.

A tool for policymakers and practitioners in urban design, landscape architecture and emergency planning has been designed by Bristol City Council to understand how current heat vulnerability differs across the community, and how climate change might increase temperatures in the future. The tool can provide insight into how urban heat risk varies and identifies areas that could impact people the most to help the council and other decision makers build a city resilient to extreme heat.

Source: SWM (2022) Climate change adaptation : practical examples for local authorities.





The Local Economy

The potential financial cost of climate change on the UK economy is significant. The UK Gross Domestic Product (GDP) is around £2 trillion a year and it is estimated by 2050 climate change could represent a 2% loss in GDP².

Extreme weather events and changing weather patterns can disrupt business operations due to premises overheating and flooding and can cause disruption to staff travel and the supply chain.

Climate change, and in particular extreme weather events being experienced across the world can impact the local economy through increased risk of price volatility for imported materials and commodities. Businesses should consider ways to build greater resilience into operations to remain competitive and reliable.

A recent survey found 65% of UK SMEs have been financially impacted by their lack of

response to weather information and 40% of SMEs have saved money by checking and acting on weather forecasts. Greater resilience to climate change can be achieved through an improved understanding on the importance of factoring climate change into business decisions. We can help to encourage change by finding out what type of climate related challenges businesses face and sharing good practice information.

As climate change resilience is increasingly adopted across all sectors new business opportunities will arise in the green economy and ecosystem services.

Through our work with the Skills Advisory Panel and Local Skills Improvement Plan we know the demand for green skills will grow in the coming years. There is an opportunity to consider how we can support residents in gaining appropriate skills to take advantage of these forthcoming opportunities.

² Sustainability West Midlands (2022) - *Weathering the Storm. A guide to saving and making money in a Changing Climate*



Our Approach to Adaptation

In preparing plans for a more resilient Staffordshire the County is faced with the challenge of responding to a broad range of uncertain risks. Some services may not have been impacted in the past but could be sensitive to changes in the future.

We will be pro-active in introducing positive changes through developing specific plans, policies and programmes using national policies and statutory requirements to aid change. Since we are uncertain about the long-term projections for the changing climate, we need to be flexible to cope with possible future changes to build organisational resilience.

Through identifying priorities and working together Staffordshire Councils will build a more resilient society and economy. This will provide people with a safe, comfortable place to live and work.

We will put in strong governance to:

Improve the policy and incentive framework and integrate adaptation considerations into policies, plans, strategies and programmes. Risks will be actively managed to ensure the policy framework keeps pace with the changing climate.

Ensure decision making will consider resilience to the impacts of the changing climate, particularly severe weather on service delivery.

Develop, innovate and adopt good practice.

Further details on the key risks, opportunities and outcomes for Staffordshire are outlined in Appendix 1.

Communications and awareness raising

Effective communication is essential to build a more resilient Staffordshire. Working collaboratively across the Staffordshire councils and with our partners we will:

- › Raise awareness and share information of climate change challenges, issues, threats and opportunities.
- › Seek out opportunities to work collaboratively with communities and external organisations, build resilience to climate change and achieve widespread and sustained change.

Monitoring, evaluation and improvement

This strategy is just the beginning of an ongoing process to identify the most important things we need to do to adapt to climate change. The future effects of climate change are uncertain and will depend on our actions to reduce global emissions.

By understanding the potential impacts and being prepared to change our plans as needed, we can be innovative and stay ahead of the curve. We'll constantly review the situation and use research to check if our adaptation measures are still appropriate.



Appendix 1

Climate Risks and Opportunities

The identified risks and opportunities are not exhaustive and have been listed as a guide for Adaptation Plan preparation. We will protect lives and livelihoods in Staffordshire by reviewing the risks and opportunities on a regular basis to accommodate changes in climate change projections.



Critical Infrastructure and Buildings

Risks and Opportunities	Outcomes
Resources required for infrastructure maintenance and repairs due to climate change and extreme weather events: • Milder winters may reduce building heating requirements, cold weather related damage and associated maintenance costs. • Hotter summer extremes can lead to buildings and equipment overheating and increased health risks. • Flooding (river, surface water and groundwater) and storm damage (erosion and embankment failures) can compromise buildings and infrastructure.	Facilities are robust to withstand climatic conditions such as flooding and heatwaves: • Infrastructure most at risk from climate change are assessed to prevent the risk of damage or failure. • New developments and redevelopments consider blue and green infrastructure in combination with good building design to provide a healthier and more sustainable environment and steered away from areas of high flood risk. • Targeted flood prevention work in combination with green infrastructure and catchment management to reduce the potential of widespread flooding and damage.
Service delivery impacts due to power outages or disruption to energy network during extreme heat events	Measures in place to minimise impacts from grid disruption during extreme weather events
Road closures and hazardous conditions due to extreme weather	• Road surfaces and foundations are more resilient to extreme weather conditions • Business continuity plans are in place to allow for services to continue during road closure events.



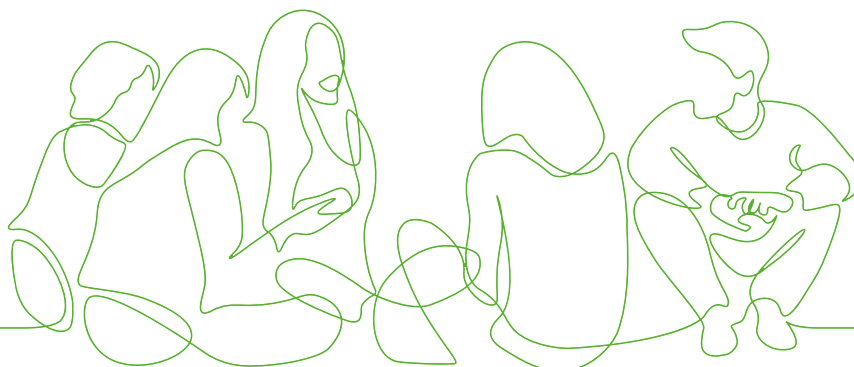
Natural Environment and Green Spaces

Risks and Opportunities	Outcomes
Changes in timings of seasonal events may lead to • Disruption in the availability of important natural food sources putting species as well as ecosystem services at risk. • Reduction in time windows for management maintenance and enhancement work putting additional pressure on resources.	• Better understanding of species habitat requirements, especially those at risk to allowing for tailored diverse habitat management • Maintained and enhanced wildlife corridors and patch sizes to increase ecological resilience • Management regime adjusted to account for climate influences and budget restraints.
Changing climate may allow pests, diseases and non-native species to thrive, threatening native habitats and species.	Habitats and species most at risk monitored and actions delivered as required.
Wildfires causing damage to habitats, species and peatland.	Sensitive areas mapped, maintenance of firebreaks and emergency fire risk action responses identified.
Extreme weather can compromise footpaths and associated infrastructure	A holistic approach to catchment management with greater consideration to soft engineering solutions.
Opportunities for natural carbon stores, carbon sequestration and natural cooling and flood risk management	The potential for biodiversity net gain maximised and blue and green infrastructure integrated through planning approvals.
Natural flood risk management	• Improved understanding of flood risk management. • Partnership approach taken allowing for whole catchment management integrating blue and green infrastructure. • Communities are more informed and have resilience to flood events. • Sustainable management of drainage and flood defence systems • New planning policies, site allocations and future infrastructure needs consider flood risk. • Flood risk for new developments is considered and managed in a sustainable manner.
Requirement under the Environment Act 2021 for a Local Nature Recovery Strategy to be produced	Local Nature Recovery Strategy considered in planning, development and land management decisions.
A minimum of 10% biodiversity net gain to be delivered on planning permissions.	Plans in place on how to deliver biodiversity net gain.



Health, Wellbeing and Safety

Risks and Opportunities	Outcomes
Occupational Health and Safety of the workforce • High temperatures and more frequent exposure to heat will increase risk of heat stress, air pollution and UV exposure particularly to outdoor staff. • Staff responding to extreme weather events such as storms or wildfires are in high risk situations and add additional pressure on staff resources to manage the incident. • Extreme weather events can prevent services being delivered (road closures, extreme heat etc.). • Overheating of buildings can reduce working effectiveness or closure of services.	Health and safety effects of climate change and climate change risks are integrated into Health and Safety Plan assessments, Corporate risk assessments and associated policies. Business continuity plans consider how services can be maintained during extreme weather events. New developments and redevelopments consider blue and green infrastructure in combination with good building design to provide a healthier and more sustainable working environment.
Extreme weather can impact on the health and wellbeing of communities, especially the vulnerable, including older people, children and those living in area of higher deprivation.	New developments and redevelopments consider blue and green infrastructure in combination with good building design to provide a healthier and more sustainable indoor and outdoor environment.
Widening health inequalities due to more extreme weather.	Community resilience programmes in place, particularly for those most at risk of the changing climate. Community resilience programmes in place, use data and analytics to target programmes such as Warmer Homes to those who are at greatest risk.
Drier warmer summers provides greater opportunity to use outdoor spaces.	Parks and open spaces are fit for the future Key walking and cycling routes are resilient to climate change



The Local Economy

Risks and Opportunities	Outcomes
Extreme weather events lead to: • Disruption to business operations. • Disruption to the distribution and the supply chain. • Price volatility for materials and commodities.	Councils have a good understanding of risks to businesses from the changing climate allowing for sharing of good quality information. Businesses have a better understanding of climate change risks, the urgency and how to integrate resilience to climate change considerations into business planning.
Potential skills gap as the demand for Green Economy and Ecosystem Services increases	Skills/knowledge gaps for the Green Economy and Ecosystem Services identified through working with partners such as the Chamber of Commerce. Training opportunities and programmes identified through closer communications with partners including Local Enterprise Partnerships and higher education. Training for the Green Economy and Ecosystem Services facilitated.





Appendix 2

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